

CLAIM AMENDMENTS

1. (Currently Amended) A method of controlling residual stress in conjunction with an additive manufacturing process, comprising the steps of:

providing a substrate;

providing a deposition head including a laser outputting a laser beam surrounded by a metal powder feed;

heating a localized region of the substrate with the laser beam to create a melt pool while feeding metal powder into the melt pool to achieve the build-up of material in a deposition zone; [[and]]

directing the beam of one or more lasers into the zone following the deposition of the material at a temperature less than the melting point of the material as a means of controlling residual stress; and

adjusting wherein the location or intensity of the laser beam(s) used to control the stress is ~~varied~~ to adjust the location and/or magnitude of the residual stress.

2. (Original) The method of claim 1, wherein the laser used to deposit the material is also used to control the residual stress.

3. (Original) The method of claim 1, wherein a plurality of lasers are used to control the cooling rate of the deposited material.

4. (Canceled)

5. (Currently Amended) The method of claim 1, wherein the intensity of the laser beam is controlled through defocusing of the beam.

6. (Currently Amended) In a direct-metal deposition (DMD) process wherein a laser beam is used to melt a powder feed to deposit a material on a substrate, a method of controlling the build-up of

residual stress, comprising the steps of:

providing a substrate;

providing a deposition head including a laser outputting a laser beam surrounded by a metal powder feed;

heating a localized region of the substrate with the laser beam to create a melt pool while feeding metal powder into the melt pool to achieve the build-up of material in a deposition zone; and
depositing a layer of the material onto a previously deposited layer by moving the laser beam and powder feed along a prescribed deposition path; and

following the deposition path with a laser beam incapable of remelting the material as a means of controlling the build-up of residual stress.

7. (Original) The method of claim 6, wherein the laser used to deposit the material is also used to control the residual stress.

8. (Original) The method of claim 6, wherein a plurality of lasers are used to control the cooling rate of the deposited material.

9. (Currently Amended) The method of claim 6, wherein the location or intensity of the laser beam used to control the stress is varied to adjust the location and/or magnitude of the residual stress.

10. (Currently Amended) The method of claim 9, wherein the intensity of the laser beam is controlled through defocusing of the beam.